

## Weld-In Long Radius Nozzle EDUB 800 LR

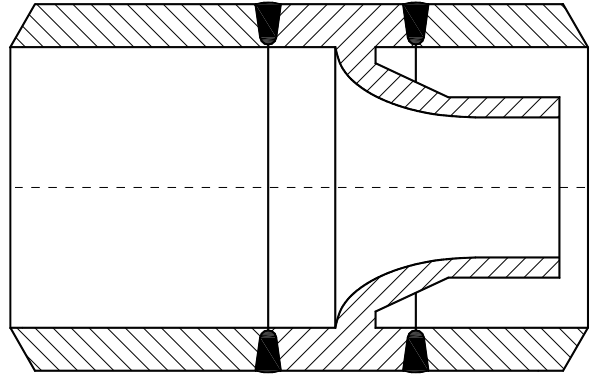
### Application

Weld-in long radius nozzles are used as flow elements for flow measurement of aggressive and non-aggressive gases, steam and liquids.

### Design

Weld-in long radius nozzles are mainly used for high pressure, high temperature applications, especially in power plants.

Long radius nozzles consist of a rounded inlet section and a cylindrical throat. The rounded inlet section has the shape of a quarter ellipse. The pressure tapings are situated in the pipe at 1D in front of and 0,5D behind the nozzle ( $D$ =pipe inner diameter). The nozzle is either welded to inlet and outlet pipe sections – often provided by the customer – or inserted into a pipe and fixed by a welding seam or pin. The welding seams are mechanically processed in order to meet the surface roughness requirements of the respective calculation standard.



### Advantages

Weld-in flow elements are the recommended choice for high pressure and high temperature applications because they minimize leakage. The single bore tapings are easy to clean and thus suitable for process fluids which may accumulate dirt, become resinous or for plants which are not operating constantly.

### Measuring Uncertainty

approx. 2% of the discharge coefficient  $C$ , depending on the application

### Pressure Loss

The pressure loss depends on the diameter ratio  $\beta$  ( $d/D$ ) and amounts to approx. 30 - 80% of the differential pressure.

### Nominal Diameter (ISO 5167)

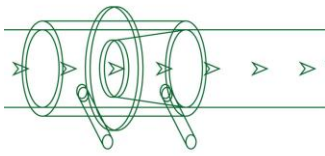
DN 50 to DN 630 / 2" to 26" (if requested other sizes are possible)

### Pressure Rating

PN 40 to PN 400 / 150# to 2500# (ASME)

### Connection Type

Weld preparation according to EN ISO 9692 (DIN 2559), ASME B16.25 or customer standard.



## Standard Installation Lengths L (similar to DIN 19215)

The total length includes welded inlet and outlet pipe sections, typically-provided by the customer.

Longer inlet and outlet pipe sections are also possible.

### Bore Diameter "d"

The calculation of the bore diameter is based on the supplied process data. All relevant standards and regulations will be considered. The calculation is part of the scope of supply.

### Pressure Taps

Pressure taps will be designed according to customer requirements. Typical tap designs are:

- plain ends for fittings
- butt weld ends
- threaded ends
- flanged ends

The typical tapping length is approx. 100 mm.

### Marking

Tag no. of flow element

Pressure rating "PN"

Pipe inner diameter "D"

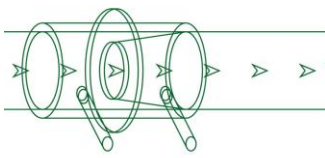
Bore diameter "d"

Material, direction of flow and tagging of pressure tapplings with "+" and "-"

### Materials

The following table shows a selection of typical materials utilized for weld-in nozzles. The material is chosen based on process medium, pressure and temperature. The pressure tap material is selected to be equivalent to the pipe material.

DN	Inlet length (mm)	Total length (mm)
50	150	250
65	180	300
80	230	350
100	280	400
125	350	500
150	400	600
200	570	800
250	690	1000
300	820	1200
350	950	1400
400	1050	1500
450	1200	1700
500	1370	2000

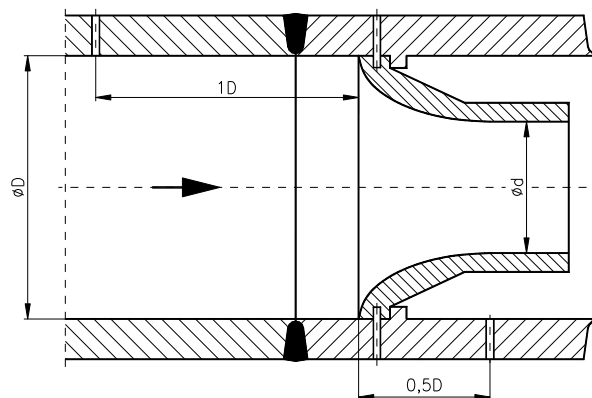
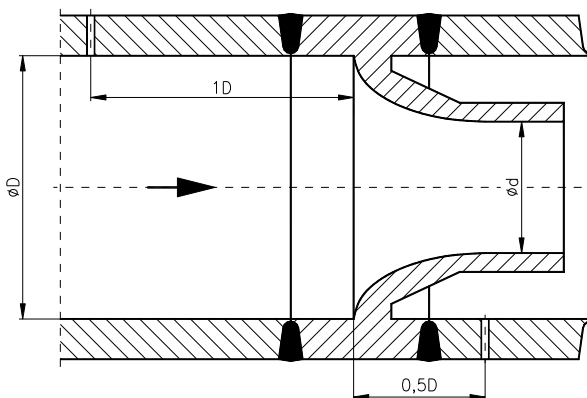


Nozzle material	Description	DIN material no.	ASTM / UNS
non-alloy steels	P 250GH (C22.8)	1.0460	~A105
	A105	~1.0432	A105
heat resistant/alloved steels	16Mo3	1.5415	A182 Gr. F1
	13CrMo45	1.7335	A182 Gr. F11
	10CrMo910	1.7380	A182 Gr. F22
	15 NiCuMoNb 5	1.6368	-
	X10CrNiMoNb91	1.4903	A182 Gr. F91
stainless steels	X2CrNiMo17-12-2	1.4404	316L
	X6CrNiMoTi 17 12 2	1.4571	316Ti
high corrosion-resistant alloys	Hastelloy C276	2.4819	N 10276
	Monel 400	2.4360	N 04400

## Example Designs

Nozzle with welded inlet and outlet pipe sections

Inserted nozzle fixed with pins



## Installation

To be welded to pipes on construction site.

## Quality Control

Manufacture and Test work is done according to the relevant codes and standards such as AD 2000, EN 13480, ASME Codes (without stamp) or customer specifications.

Inspection certificates according to EN 10204 3.1 and 3.2. are furnished if ordered. Special inspections are available upon request.

## Accessories

Instrument valves, condensate pots, manifolds, mounting accessories can be included for additional charges.